WiComm®

Wireless LAN Connectivity for Serial Devices

User's Manual Version 1.0

Device Networking Experts
SystemBase
Since 1987

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Revision History

Revision Date	Document Version	Pages	Description
10/25/2005	1.0	All	Initial release by jhkim
11/29/2005	1.0a		Jhkim Added console commands Added front page

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Chapter 1. Product Overview

1. Introduction

WiComm is a high-performance, standalone device designed to connect a wide range of equipment (i.e., security devices, telecommunications equipment, modems, data display devices, industrial instrumentation, etc.) to wireless LAN. WiComm supports RS232, RS422, or RS485 serial interfaces at a variety of baud rates (data transmission speeds), automatically senses both 100baseTX Fast Ethernet and 10baseT Ethernet network connections, and the connects to 802.11b wireless networks as well. Other than the standard model, WiComm also includes a model that supports Modbus protocol, which is used to communicate with many types of industrial devices (e.g., instruments, meters, controllers, switches, etc.) over a serial-to-Wireless LAN connection.

The installation can be performed by the least-experienced users, while providing networking professionals with advanced features for configuration. We are confident that you will enjoy the many features of WiComm.

2. Package Contents

- 1 piece of WiComm
- Software & Documentation CD
- Power Supply Adapter
- Serial Cable

3. About This User Guide

This User's Guide contains information on system requirements, basic troubleshooting, and instructions on the following:

- Installing WiComm hardware
- Configuring WiComm for use with a serial device
- Configuring WiComm for use on your network
- Configuring WiComm using the ExtendView Utility

NOTE: WiComm can be used with a variety of network operating systems and protocols. Please refer to Chapter 3. Configuration & Management for detailed information.

4. Windows™ System Requirements

To configure the settings of WiComm using the provided ExtendView Utility in Windows, your Windows-based system should include the following components:

- A PC with a 133 MHz or higher processor
- Microsoft Windows 98SE, ME, 2000, XP, or 2003 server operating system
- At least 64 MB of RAM (memory)
- At least 10 MB of free hard disk space (to install the software)
- A CD-ROM drive (to load the software)
- An Internet connection through a cable or DSL modem, or any other means

5. Wireless Device Server Requirements

To use the wireless Device Server, you need an 802.11b wireless network consisting of either of the

following:

- An 802.11b wireless-enabled PC or device to be directly connected to WiComm (Ad-Hoc or Peer-to-Peer Mode)
- An 802.11b wireless access point that allows wireless and wired Ethernet-enabled computers to connect to WiComm

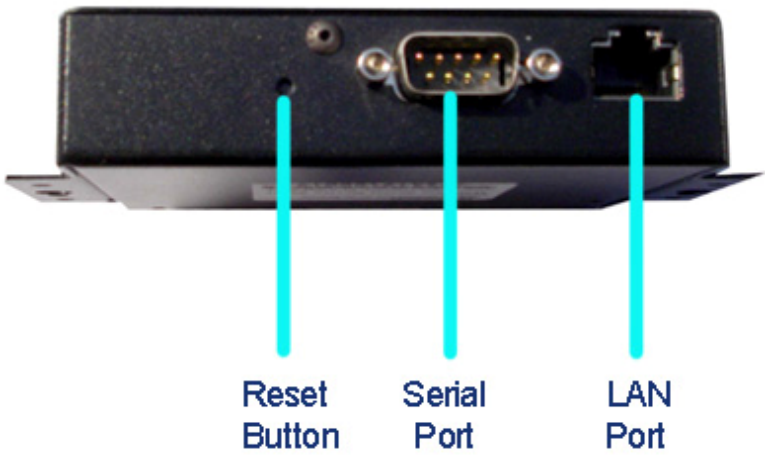
To configure the wireless Device Server, you will need the following information from your wireless network administrator:

- Wireless Mode used (Infrastructure or Ad-Hoc)
- The SSID (service set identifier) for your wireless network.
- The Radio Frequency Channel of the wireless network
- If you are using TCP/IP (recommended for Windows Networks) and not connected to a DHCP (Dynamic Host Configuration Protocol) server (for obtaining an IP Address automatically), you will need a unique IP Address for the wireless Device Server (for example: 192.168.1.14). If WiComm is not on the same IP subnet as the computers you are connecting from, you will also need a subnet mask and a router (default gateway) address.
- Wireless Security Settings (WEP keys, 802.1x settings, etc.)

6. Component Descriptions

WiComm includes the following components as described below:

- Power connector – The power supply cable plugs into this connector.
- Reset button – Pressing this button for less than five seconds will print a test page (if the device is connected to a serial printer). Pressing and holding this button for more than five seconds will reset WiComm to factory default settings.
- LED status indicators – Used to indicate the operational states of WiComm. Refer to the next page for detailed LED status light descriptions.
- LAN port – This port (8-pin RJ45 jack) is used for connecting WiComm to an Ethernet card, hub, router, or other wired access point for network access.
- Serial port – This port (PC-compatible 9-pin male DB-9 connector) can be configured to connect WiComm to equipment that uses the RS232, RS422, or RS485 serial interface.



7. LED Indicators

WiComm provides three multifunction LED (Light Emitting Diode) indicators (yellow, green, and orange) for easy monitoring. The following table defines the function of each LED.

LED	State	Status
POWER (ORANGE)	**ON**	The device is receiving power
	OFF	The device is not receiving power
	Blinking	The device's power supply is malfunctioning
LINK (YELLOW / GREEN)	**Yellow OFF** **Green OFF**	No network activity
	Yellow ON **Green OFF**	10baseT network active
	Yellow Blinking **Green OFF**	10baseT network data received
	Yellow OFF **Green ON**	100baseTX network active
	Yellow OFF **Green Blinking**	100baseTX network data received
	Yellow ON **Green ON**	Wireless network active
	Yellow Blinking **Green Blinking**	Wireless network data received

8. Reset Button Functions

Action	Result
Depress for less than 5 seconds	Generates configuration data that can be viewed using a terminal emulator (e.g., Windows Hyper Terminal) or other equipment that can display ASCII characters, or it will initiate a test page if WiComm is connected to a serial printer.
Depress for more than 5 seconds	Resets WiComm's configuration to factory defaults (cold reset). The unit will automatically re-initialize after updating the configuration memory.
Depress for 3 seconds during power up	Places the device into console configuration mode, which can be used to configure the device via WiComm's serial port.

9. Factory Default Settings

WiComm is shipped with a default configuration that will work with the most common serial-to-Ethernet and wireless connections. The default settings can be changed to suit specific installation requirements via the ExtendView Utility, the embedded Web server, or via a Telnet connection to WiComm's internal console. The factory default settings can be easily restored at any time by performing a cold reset (press and hold the pushbutton on the device for more than five seconds).

1) Port Parameters and Modbus Settings

Parameter	Description	Settings
CHARACTER	bits per character	7, 8 (default)
FLOW	flow control	NONE (default), Xon/Xoff, CTS/RTS
PARITY	parity	NONE (default), EVEN, ODD, MARK, or SPACE
SPEED	baud rate (bits per second)	300, 600, 1200, 2400, 3600, 4800, 7200, 9600 (default), 14400, 19200, 38400, 57600, 76800, 115200 (console port default), 230400, 460800
STOP	stop bits per character	1 (default), 2
MODE	line mode (serial port protocol)	232 (default), 422, 485, 485HD, Disabled
ECABLE	E-Cable mode (for TCP connections)	Enable, Disable (default)
ECADDR	E-Cable destination IP address	(set by user)
ECONN	E-Cable connection attempt time	20 seconds
ECPORT	E-Cable destination IP port number	9100 (default), or set by user

MULTI	multidrop protocol	Host (default), Modbus
MBTYPE	Modbus attached device type	RTU slave (default)[2], ASCII slave
MBINIT	Modbus initialization delay interval	100 – 3276 ms (default = 100 ms)
MBAUTOID	Modbus auto slave ID	Enable (default)[1], Disable
MBCHARTMO	Modbus character timeout interval	10 – 3000 ms (default = 100 ms)
MBMSGTMO	Modbus message timeout interval	10 – 3000 ms (default = 1000 ms)
(N/A)	Modbus/TCP Exception handling	Enable, Disable (default)

2) Configuration Notes

1. The Modbus/TCP protocol contains a "Unit ID" field to identify multiple Modbus slave devices that are accessible at a single IP address. When the Modbus/TCP command contains a Unit ID, the Modbus Gateway can pass the Unit ID to Modbus serial devices, which allows multiple serial devices to be linked with a Modbus Gateway. When Auto Slave ID is enabled, a unit ID will be assigned automatically. If the Auto Slave ID is disabled, a unit ID (any number between 1 and 247) must be manually assigned in the Slave ID field.

2. When the Modbus serial protocol is set to Modbus/RTU, WiComm is ready to receive connection requests from Modbus/TCP master devices. Each message packet is determined by a character timeout. An incorrect character timeout may cause a CRC (Cyclic Redundancy Check) checksum error. Modbus ASCII slave mode functions the same as Modbus/RTU slave mode, except that the data format is Modbus/ASCII.

3. The Modbus/TCP Exception is in effect when the Modbus Gateway connects a Modbus/TCP Master with Modbus serial slave devices. When the Modbus Gateway cannot get a response from Modbus serial devices, the Modbus serial protocol will not respond to the master device. However, the TCP protocol has a longer waiting time, which could cause a network traffic problem for Modbus/TCP. For this reason, the Modbus Gateway can automatically send a Modbus exception code 16 to the Modbus/TCP master device when there is not response from the Modbus serial slave devices, thereby making overall network communication much more efficient.

Chapter 2. Hardware Installation

1. Installing WiComm

Follow the steps below to install WiComm. In most cases, WiComm's factory default settings should be sufficient for most serial connections; however, some of the configuration settings may have to be changed for your particular installation. WiComm can be wall mounted, set on the desktop, or mounted using the optional DIN rail kit.

1. Before attempting to install WiComm, make sure you have installed and set up your serial equipment as described in the documentation that came with the device.
2. Write down the 12-digit MAC (Media Access Code) address printed on the label located on the bottom of WiComm (for example: 004017023F96). You may need this number in order to configure WiComm.
3. Connect WiComm to your equipment using a standard PC-compatible 9-pin (DB-9) serial cable for RS-232 type devices (refer to Appendix A for pinout descriptions). A custom cable may be required for RS-422 and RS-485-type serial devices. For RS-422/RS-485-type devices, a 120-ohm terminating resistor may be required at the receiving end of a differential pair if the device is at the end of the cable (refer to Appendix C for detailed information).
4. Plug WiComm power supply adapter into a suitable AC receptacle, and then plug the power supply cable into WiComm. WiComm will run through a sequence of power-up diagnostics for a few seconds.
    - If WiComm is operating properly, the LEDs will blink momentarily and then go out, the yellow and green LEDs will illuminate if the wireless network is active, and the orange LED will illuminate, indicating the device is receiving power.
    - If the orange LED blinks continuously in a regular pattern, a problem exists. If this is the case, try powering the unit OFF and then ON again. If the problem persists, refer to the Troubleshooting section in this User Guide.
5. Choose a spot for WiComm within the communication range of the nearest Access Point. Connect WiComm to your network through a switch or hub using a category 5 (CAT5) Ethernet cable when wired

communication is required. WiComm's IP address must be configured before a network connection is available. If your network offers DHCP (Dynamic Host Configuration Protocol), WiComm will automatically search for a DHCP server upon power up and obtain an IP address. If your network does not offer DHCP, a static (fixed) IP address must be assigned (see your system administrator for assistance). In most cases, a fixed IP address is preferred because a DHCP server may not always assign the same IP address to WiComm when WiComm is powered ON.

WiComm also supports the following protocols. See your system administrator for help.

- arp
- rarp
- BootP

NOTE: The IP address must be within a valid range, unique to your network, and in the same subnet as your PC (refer to Appendix A for a list of TCP port connections).

NOTE: If a wired connection is established to WiComm, the wireless link will be disabled.

Chapter 3. Configuration & Management

1. Configuration Options

After the hardware installation has been successfully completed, WiComm can be configured and managed via an Ethernet and/or wireless connection using the ExtendView Utility (recommended), the embedded web (HTTP) server pages, or WiComm's internal configuration console, which can be accessed via a Telnet connection or directly through WiComm's serial port. Additional options for configuration and management of WiComm are available as third-party utilities that can be downloaded from their respective web sites as noted below. You can configure it via an Ethernet connection or configure it via a wireless connection as described.

1) ExtendView Utility

- a Windows TCP/IP utility used for configuring WiComm's port, network, and wireless settings.
- uses a 32-bit graphical user interface.
- works with Windows PCs running the TCP/IP protocol.
- included on WiComm Software & Documentation CD.
- after installation, this utility can be run from the START menu.

2) Installing the ExtendView Utility (Windows operating systems)

1. Ensure your PC is connected and has access to your network.
2. Connect WiComm to either wireless or wired network. Ensure WiComm is powered ON.
3. Insert the CD supplied with your WiComm into the CD-ROM drive of your computer. The CD should automatically start and display a menu screen.
4. Select ***Install ExtendView***. After the installation is complete, you can start the ExtendView utility by clicking on ***Start***, ***Programs***, and then ***ExtendView***.

3) Web Browser Interface

- allows you to configure WiComm with a standard web browser (e.g., Firefox or Microsoft Internet Explorer).
- no additional software is needed on the system.
- can be used on any system that supports web browser capabilities.
- type the IP address into your web browser address bar to connect.
- the default password is ACCESS (not case sensitive).

4) HP Web JetAdmin Utility

- a web browser-based utility (works with browsers like Internet Explorer or Firefox).
- can be downloaded from the HP web site http://www.hp.com.

5) Command Console

- a command-line-oriented console.
- contains some advanced features not available through ExtendView or the Web Browser Interface.
- the default password is ACCESS.
- can be accessed via Telnet or via a direct connection to WiComm's serial port.
- When connecting via Telnet, enter the IP address of WiComm and the TCP port. (by default, the port is 9100 or 3001)
- When connecting via serial port, reset button should be pressed for 3 seconds upon power-on. Press Enter after the power is on to enter the command mode.
- type HELP for a list of console commands.

2. Using the ExtendView Utility to Configure WiComm

For Microsoft Windows operating systems, the ExtendView Utility is the recommended method of configuring one or more Device Servers on your network. Once WiComm obtains an IP address (occurs automatically when the unit is powered ON and connected to a DHCP network), the ExtendView Utility's auto-discovery

feature will search for and locate all Device Severs on the network and then display the IP address for each discovered Device Server.

1. Start the ExtendView Utility by clicking on ***Start***, ***Programs***, and then ***ExtendView***.
2. When the Welcome screen appears, click on ***Next***, choose any name for your ***View Name***, select ***Automatically create a view with default settings*** (or configure the view to your preferences), and then click on ***Finish***.
3. Right-click on WiComm that you want to configure from the displayed list, and then left-click on ***Configuration***. The default Device Server name is TWC_xxxxxx (where xxxxxx is the last six digits of the MAC address from the label located on the back of WiComm).
4. If you are using TCP/IP (recommended for Windows) and you do not have a DHCP server (see note below), you will need to manually assign a valid IP Address (if you are not sure what IP address is valid, ask your network administrator), and then click on ***OK***.

NOTE: If you are using DHCP on your network, WiComm should have acquired valid IP settings at this point and no further configuration is necessary. However, for most installations, a static IP address is preferred. If your DHCP server does not allow WiComm to keep its assigned IP address permanently, then you must manually assign an IP address. In this case, use a static IP address outside the range reserved for DHCP (see your DHCP server documentation for details). To assign a static IP address, right-click on WiComm in the menu, and then select *Configuration*. On the TCP/IP tab, under *IP Address Resolution*, select *Set Permanent*, and assign a valid static IP address for your network. Click on *OK* to save the new settings.

5. Configure the 802.11b wireless settings. To operate on an 802.11b network, WiComm configuration must be set to the same configuration as your wireless network to allow WiComm to communicate over your wireless network. All nodes of a wireless network need to have the same settings to allow communication between the devices. Following parameters need to be set.
    - wireless mode (ad-hoc or infrastructure)
    - SSID channel
    - data rate
    - wireless security settings (WEP keys, 802.1x settings, etc.)

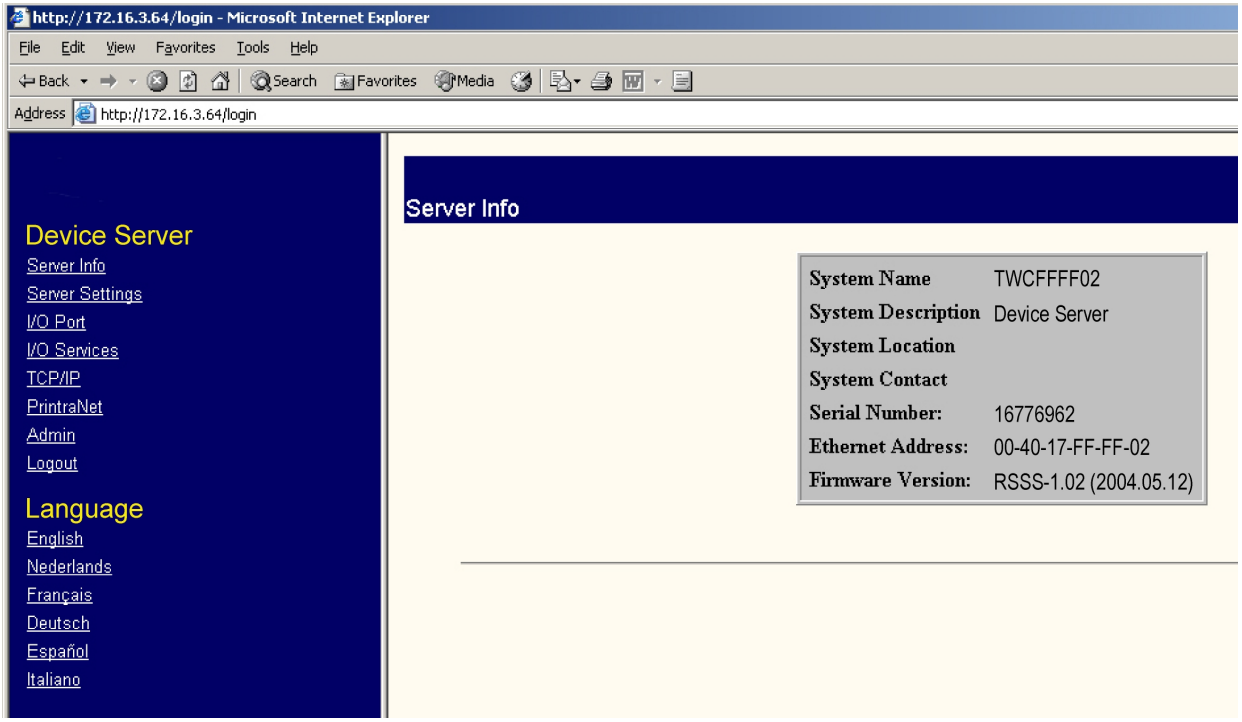
NOTE: The ExtendView Utility and Web Browser interface contain help screens to assist you with WiComm's security settings.

3. Using the Web Browser Interface to Configure WiComm

To configure WiComm using non-Windows operating systems (e.g., Unix systems), a standard web browser (e.g., Internet Explorer or Firefox) can be used to access WiComm's embedded Web (HTTP) server pages, which contain WiComm's configuration options. No additional software is required.

1. Make sure that WiComm and the PC are connected on the same network.
2. Ensure that the power of WiComm is on. For the wired configuration, connect LAN cable to the LAN port of WiComm, and for the wireless configuration, make sure the wireless parameters are correctly set. More information on wireless setting is discussed in details on **6. First-time Configuration of WiComm Using 802.11b Network.** Now, if the network settings are correct, you can connect to WiComm by its IP address. If you know the IP address of WiComm, you can skip to the step 5. For the case where IP address is not known to the user, (i.e. when using the DHCP server) you can detect the IP address of WiComm via steps 3 and 4.
3. In order to view the IP settings of WiComm, it needs to be connected to either the PC or any serial device that can print ASCII characters, via serial connection.
4. When the powers of both WiComm and the PC (or the serial device) are on, press the reset button of WiComm for about 1 second or more, but not longer than 5 seconds. Then the WiComm configuration data is transferred via serial port. Factory default IP address of WiComm is 192.0.0.192. Be careful not to assign the same IP address with the PC, since this might cause IP address collision.
5. From the host computer, open a standard web browser, enter the IP address of WiComm into the address bar of the web browser, and then press ***Enter***. The Web Browser Utility screen will be displayed. Click on the ***Login*** menu selection, enter the password (default is ACCESS), and then click on ***Submit***. The main screen will be displayed, allowing you to configure the settings of WiComm. The menu selections are displayed on the left side of the screen, and the individual settings are located at the top of the screen.
6. Configure the 802.11b wireless settings. To operate on an 802.11b network, WiComm configuration must be set to the same configuration as your wireless network to allow WiComm to communicate over your wireless network. All nodes of a wireless network need to have the same settings to allow communication between the devices. Following parameters need to be set.

- wireless mode (ad-hoc or infrastructure)
- SSID channel
- data rate
- wireless security settings (WEP keys, 802.1x settings, etc.)



4. Using the Telnet Command Line to Configure WiComm

1. Ensure WiComm is connected via an Ethernet cable to the host computer.
2. From the Windows ***Start*** menu, click on ***Run***, and then type the following command (where x.x.x.x. is the IP address of WiComm). The system will use the default port 23 to access WiComm via Telnet.

   telnet X.X.X.X
3. After a connection is established, press Enter to get the "**#**" prompt, enter the password ACCESS (it will not 'echo' on your screen), and type anything in response to the ***Enter Username>*** prompt. When the ***Local>*** prompt appears, you are ready to enter commands.

5. Using the Serial Console to Configure WiComm

WiComm's command console can be accessed via a direct connection to WiComm's serial port using a COM port emulator and a null modem serial cable.

1. Attach one end of a null modem serial cable to the DB-9 serial port of WiComm, and the other end of the cable to the COM port on your computer.
2. Press and hold WiComm's test button for at least three seconds while powering up the device. When WiComm has finished initializing, the internal configuration console will be ready to accept commands.
3. Start a terminal emulation program (e.g., Windows HyperTerminal), making sure you are connecting with the relevant COM port.
4. Use the following settings for the connection:
    - BITS PER SECOND: 115200 bps
    - DATA BITS: 8
    - PARITY: NONE
    - STOP BITS: 1
    - FLOW CONTROL: NONE
5. Once connected, press Enter to continue. The ***Local>*** prompt will appear, indicating that the system is ready to accept commands. For a list of commands, type ***help*** at the command prompt.

6. First-Time Configuration of WiComm Using 802.11b Network

Although WiComm can be configured using a wireless connection, it is recommended that WiComm be initially configured using a wired connection as described on the previous pages. WiComm's wireless network interface supports all modes of 802.11b at 1, 2, 5.5, and 11 Mbps. The wireless network is only active if WiComm is not connected to a wired network. If a wired link is established to WiComm, the wireless link is automatically disabled. To configure the wireless Device Server for the first time from a computer via an 802.11b wireless connection, you will need to temporarily change your computer's settings to match the default settings of WiComm as follows:

- Wireless Mode: Ad-Hoc (sometimes referred to as Peer-to-Peer)
- Channel: 11
- SSID (or wireless network name): serserv

You should now be able to configure your WiComm using either the ExtendView Utility or the Web Browser Interface as described in the previous sections.

NOTE: Be sure to set your PC back to its original wireless settings after you finish configuring the wireless Device Server.

NOTE: It is not necessary to change your computer's settings if you are configuring WiComm's settings via an Ethernet connection.

7. Verifying WiComm's Connection to a Serial Device

1. Verify that both WiComm and the connected equipment are powered on and ready, and that a serial cable is properly connected between WiComm and equipment (i.e., transmit signal output from WiComm going to the receive signal input on the equipment, ground leads connected together, etc.).

NOTE: Before attempting to use WiComm, you must verify the connection between WiComm and the connected equipment. If this connection is not working, you will not be able to send and/or receive data from the connected equipment.

2. Verify that WiComm's port settings (i.e., baud rate, flow control, character bit size, parity, etc.) exactly match the settings of the connected device's port.
3. If the equipment connected to WiComm is able to display or print ASCII characters (such as a terminal emulator or serial printer), then communication between the devices can be verified by pressing the ***Reset*** button on WiComm for about one second (but less than five seconds), which will initiate the output of configuration data from WiComm to the connected equipment.
    - If communication has been successfully established between the two devices, the equipment should be able to display or print WiComm's configuration data.
    - If no data is displayed or printed, verify that both devices are powered ON, are properly connected using a suitable serial cable, and are using compatible serial port parameters. The two most common serial communication problems are due to the either the cabling and/or mismatched serial port parameters.

NOTE: If WiComm is connected to equipment that cannot display or print ASCII characters, then it is recommended that another device capable of displaying or printing ASCII characters be temporarily connected to WiComm in order to verify the serial connection. After successful communication is verified using the temporary device, reconnect the original device, making sure that the original device is configured with serial port parameters that match the tested connection.

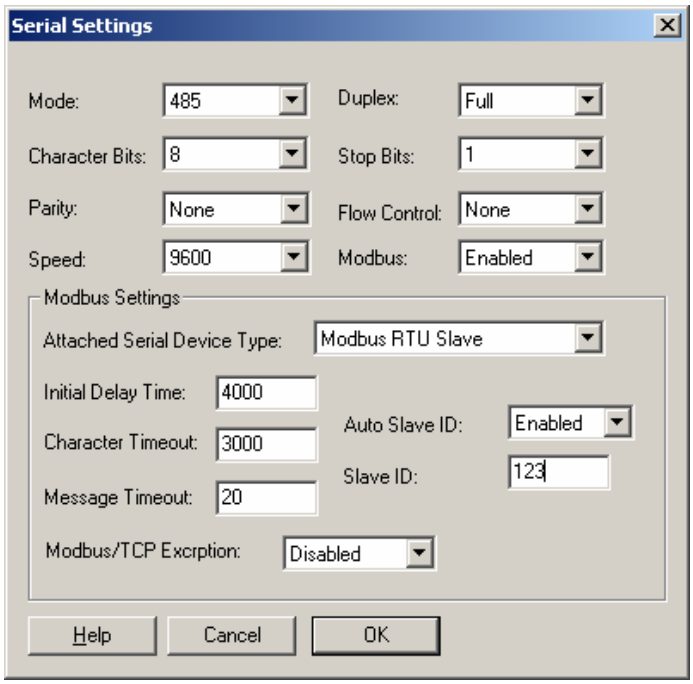
- If you are unable to establish a working serial connection between WiComm and the connected equipment, refer to the troubleshooting chapter in this User Guide. For additional troubleshooting assistance, contact SystemBase staff.

8. Changing the Serial Settings

In order to establish communication between WiComm and a device, the serial settings for both devices must match. The serial settings can be changed using ExtendView (recommended), the web browser interface, or WiComm's internal configuration console (refer to the previous sections for the installation and use of these utilities).

1) Using the ExtendView Utility to Change the Serial Settings

1. Start the ExtendView Utility by clicking on ***Start***, ***Programs***, then ***ExtendView***.
2. From the main menu, click on ***Options***, and then click on ***Configuration***.
3. Click on the ***Output Port*** tab, and then click on the ***Serial Settings*** button.
4. After configuring the serial settings, click on ***OK*** to continue.



2) About Baud Rate

In some cases it may be necessary to change the baud rate of the Device Sever in order to match the baud rate of a particular device where the baud rate is fixed. Baud is a measurement of transmission speed in asynchronous communication and represents the number of bits that are actually being sent over the media, not the amount of data that is actually moved from one device to the other. WiComm supports baud rates from 300 to 460800 bps. To ensure communication between connected serial devices, all other serial port parameters (mode, character bits, parity, etc.) must be identical for each serial device.

3) Serial Port Protocol

WiComm's serial port protocol (data transmission mode) can be changed to match the particular characteristics of the connected device's UART (Universal Asynchronous Receiver/Transmitter). WiComm supports the following serial port protocols, namely RS-232/422/485 on one hardware.

Protocol	Description
RS-232	an interface between data terminal equipment and data communications equipment employing serial binary data interchange over a wired connection with a maximum range of 40 feet (12meters).
RS-422	a data transmission system using balanced differential signals (voltages) to send serial binary data over a wired connection with a maximum range of 4,000 feet (1.2 km).
RS-485 / RS-485HD	a data transmission system using balanced differential signals (voltages) to send serial binary data over a wired connection with a maximum range of 4,000 feet (1.2 km). As many as 32 driver/receiver pairs can share a multi-drop network (4-wire at full duplex or 2-wire at half duplex). Many characteristics of the drivers and receivers are the same as RS-422.

9. Using the Modbus Protocol

Modbus is a widely used industrial device communications protocol that provides "client/server" communications between devices connected on different types of buses or networks. WiComm supports the Modbus serial line version of the protocol used for communicating with many types of industrial devices (e.g., instruments, meters, controllers, switches, etc.) over a serial-to-Ethernet connection. In general, WiComm operates as a transparent device between the host (master device) and the connected serial devices (slaves), sending and receiving data to and from one or more slave units (up to a maximum of 32 slave serial devices). WiComm uses the RS-232 and RS-485 serial port protocol (using a 9-pin connector) for Modbus communication.

1) Serial Transmission Modes

Two connection protocol options are available between WiComm and the serial device:

- RTU (Remote Terminal Unit) Mode – allows for greater character density, which allows for better data throughput than ASCII mode. However, each message must be transmitted in a continuous stream of characters.
- ASCII (American Standard Code for Information Interchange) Mode – is used when the physical communication link or the capabilities of the serial device do not allow conformance with RTU mode requirements.

2) Typical Modbus Applications

Many traditional Modbus devices can talk over an RS-485-type serial port provided that the transmission distance between the serial device and WiComm does not exceed 4,000 feet (1.2 km). When using the RS-232-type serial port, the connection between WiComm and the serial device cannot exceed 40 feet (12 meters), which is sufficient for short point-to-point communications. Using WiComm configured as a Modbus master device, up to 32 Modbus slave devices can be placed on the same Modbus network using the RS-485-type serial port.

In a master/slave configuration, the master serial device will always initiate communication with the slave devices, and the slave devices will never talk to each other. In unicast mode, WiComm can only address an

individual slave at one time with each slave having a unique network address. In this mode, when addressed by the master, each slave returns a reply to the master device. In broadcast mode, WiComm can address all the slave units simultaneously; however, in this case, the slave devices do not send a reply to the master device.

3) Changing the Modbus Settings

In order to establish communication between WiComm and a serial device using the Modbus protocol, the Modbus settings for both devices must be compatible. WiComm's Modbus settings can be changed using the ExtendView Utility (recommended), the web browser interface, or WiComm's internal configuration console (refer to page 3-1 for detailed application use).

Chapter 4. Console Commands

This chapter describes the console commands available from the internal command console through the serial port or Ethernet port via a Telnet session.

1. Network Commands

The following group of commands configures network parameters.

SH NW

Displays summary network information

sample output:

```
WiFi Mode = INFRASTRUCTURE
WiFi SSID: wicomm
Speed = 11
Regulatory Domain = 704
WiFi FW Ver = 1F 1.7.1
AP density = LOW
TTLS is Disabled
WEP is Disabled
Link DOWN
```

SET NW AUTHtype

Set WLAN Authentication type

```
SET NW AUTHtype [OPEN |SHARED | TTLS | LEAP | WPA-PSK]
(default = Open System)
```

SH NW AUTH

Shows the wireless authentication type

sample output:

```
Authentication type= OPEN SYSTEM
```

SET NW CHannel

Set WLAN ad-hoc channel number

```
SET NW CHannel n
n = 1-11 (default = 11; value is ignored in Infrastructure mode)
```

SET NW ENC

Set WLAN Encryption Mode. Supported modes are none, 64 bit WEP, 128 bit WEP, and TKIP (WPA).

```
SET NW ENC [DIsable | 64 | 128 | TKIP ]
(default = Disable)
```

SH NW ENC

Shows the wireless encryption mode

sample output:

```
WiFi encryption is Disabled
```

NOTE: The deprecated command SH NW WEP will also display this information.

SET NW KEY#

Selects WLAN WEP key entry

```
SET NW KEY# n
n = 1-4 (default = 1)
```

SET NW KEYVAL

Set the currently selected WLAN WEP key entry to the hex value given.

```
SET NW KEYVAL <key>
key=10 or 26 hex characters (default=<null>)
```

SET NW MOde

Set WLAN mode.

```
SET NW MOde <mode>
[Infrastructure | Ad-Hoc] (default = Infra)
```

SH NW MODE

Shows the wireless operating mode

sample output:

```
Wifi mode = AD-HOC (802.11)
```

SH NW RADio

Shows the selected radio mode of operation

sample output:

```
Radio mode is 802.11b
```

SET NW SPeed

Set maximum WLAN speed.

```
SET NW SPeed n
```

```
n = 1,2,5.5 or 11 (default = 11)
```

SH NW SPEED

Show the maximum wireless data speed in megabits per second

sample output:

```
Speed = 11
```

SET NW SSid

Set WLAN SSID

```
SET NW SSid <name>
```

```
User defined (default = printer)
```

CL NW SSid

Clears the SSID value so the server will connect to any AP.

```
CL NW SSid
```

SET NW BSsid

Set WLAN BSSID (connect to a specific access point's mac address)

```
SET NW BSsid <value>
```

```
User defined (MAC Address)
```

CL NW BSsid

Clears the BSSID value so the server uses just SSID and not a specific AP.

```
CL NW BSsid
```

SET NW RTS

Set WLAN RTS threshold

```
SET NW RTS n
```

```
n = 1-3000 (default = 2432)
```

SH NW RTS

Shows the configured wireless RTS threshold

sample output:

```
Wifi RTS Threshold = 2432
```

SET NW APDEN

Set WLAN Access Point Density

```
SET NW APDEN [LOW | MED | HI]
(default = LOW)
```

SH NW APDEN

Shows the access point density

sample output:

```
AP Density = Low
```

SH NW STATS

Show the network I/O statistics

sample output:

```
WiFi statistics:
TX Unicast frames: 0
TX Multicast frames: 0
TX Fragments: 0
TX Unicast octets: 0
TX Multicast octets: 0
TX Deferred: 0
TX Single retry frames: 0
TX Multiple retry frames: 0
TX Retry limit exceeded: 0
TX Discards: 0
RX Unicast frames: 0
RX Multicast frames: 0
RX Fragments: 0
RX Unicast octets: 0
RX Multicast octets: 0
RX FCS errors: 0
```

```
RX Discards no buffer: 0
TX Discards wrong SA: 0
RX Discards WEP undecr: 0
RX Msg in msg fragments: 0
RX Msg in Bad msg fragments: 0
```

SET NW CERTCN

Set EAP Common Name

```
SET NW CERTCN <name>
User defined (default=<null>)
```

SH NW CERTCN

Shows the value of the first common name check string

sample output:

```
Common name 1
```

NOTE: The default for this string is a null (blank) string.

NOTE: The deprecated command SH NW TTCN will also return this information.

SET NW CERTCN2

Set second EAP Common Name

```
SET NW CERTCN2 <name>
User defined (default=<null>)
```

SH NW CERTCN2

Shows the value of the second common name check string

sample output:

```
Common name 2
```

NOTE: The default for this string is a null (blank) string

SET NW CERTEXP

Set EAP Certificate Exponent value

```
SET NW CERTEXP <exponent>
User defined (default = 10001 Hex)
```

SH NW CERTEXP

Shows the value of the certificate exponent

sample output:

```
65537 (10001h)
```

NOTE: The deprecated command SH NW TTEXP will also return this information.

SET NW CERTKEY

Set EAP Root Key

```
SET NW CERTKEY <key value>
```

```
User defined
```

SET NW ID

Set Authentication User ID This may include the realm, separated by a '@' character.

```
SET NW ID <user id>
```

```
(default = anonymous)
```

SH NW ID

Shows the value of the authentication ID (including realm, if present)

sample output:

```
anonymous@somewhere
```

NOTE: The default realm is a null (blank) string.

NOTE: The deprecated command SH NW TTID will also return this information.

SET NW PW

Set the password used for the 802.1x EAP authentication, if enabled.

```
SET NW PW <password>
```

```
(default = anonymous)
```

SET NW INAP

Set EAP Inner-Authentication protocol

```
SET NW INAP [PAP|MSCHAP_V2]
```

```
(default = PAP)
```

SH NW INAP

Shows the selected inner authentication mode

sample output:

```
Authentication protocol = PAP
```

NOTE: The deprecated command SH NW TTAP will also return this information.

SET NW REALM

Set the realm portion of the 802.1x EAP authentication ID. This may also be set with the ID command.

```
SET NW REALM <realm>
(default = <null>)
```

SH NW REALM

Shows the realm associated with the authentication ID, if any.

sample output:

```
somewhere
```

NOTE: The default realm is a null (blank) string.

NOTE: The deprecated command SH NW TTRE will also return this information.

SET NW WPAAUTO

Enable or disable WPA auto mode. If enabled, WiComm will connect to a non-WPA access point if a WPA enabled access point is not available. Only valid when WPA is enabled (authentication type = TKIP).

```
SET NW WPAAUTO [ENable | DIsable]
(default = disabled)
```

SH NW WPAAUTO

Shows the state of the WPA auto connect flag

sample output:

```
WPA-AUTO Enabled
```

SET NW WPAGROUP

Enable or disable WPA group key mode. If enabled, this allows group keys to be used for data link encryption.

```
SET NW WPAGROUP [ENABLE | DISABLE]
(default = disabled)
```

SH NW WPAGROUP

Shows the state of the allow WPA group keys flag

sample output:

```
WPA-GROUP Disabled
```

SET NW WPAPSK

Set the WPA PSK pass phrase or hex key. This value is only used if the authentication mode is WPAPSK.

The argument to this command is either a pass phrase of 8-63 characters, or exactly 64 hex characters representing the 256 bit PSK value.

```
SET NW WPAPSK <key>
(default = "WiComm")
```

SET NW WPATRACE

Set the WPA trace level. NOTE: This command is for diagnostic purposes only, and should not normally be used as the trace can affect performance. A value of 0 disables the trace.

```
SET NW WPATRACE nn
(default = 0)
```

2. Port Commands

SH PORT

Shows Port parameters

sample output:

```
Port Q-Size Type Attributes
*S1 0 serial 115200 N 8 1 XON/XOFF RS232
```

SET PORT

Set Parameters for specified port. The available commands are dependent on the port type.

CLEAR PORT S1 JOB

This command aborts the currently active job on the port specified. If the remote host is still connected, any further data received will be discarded.

```
CL PORT S1 JOB
```

SET PORT S1 FLOW

Set serial port flow control to NONE, XON/XOFF, CTS, or DSR

```
SET PORT S1 FLOW <flow>
(default = None)
```

SET PORT S1 PARITY

Set serial port parity to NONE, EVEN, ODD, MARK, or SPACE

```
SET PORT S1 Parity <parity>
```

(Default = None)

SET PORT S1 SIZE

Set the data bits on the serial port

SET PORT S1 Signal [7 | 8]

(default = 8)

SET PORT S1 SPeed

Set serial port baud rate. Options for BAUD are 300, 600, 1200, 2400, 7200, 9600, 19200, 38400, 57600, 115200, 230400, and 460800

SET PORT S1 SPEED <baudrate>

(default = 115200)

SET PORT S1 STOP

Set serial port stop bits per character.

SET PORT S1 STOP [1 | 2]

(default = 1)

3. Server Information Commands

SET SERVEr DEscription

Set the server description string

SET SERVEr DEscription <description-string>

SET SERVEr NAme

Set server node name

SET SERVEr NAme <name>

(default = "TWC_xxxxxx", where xxxxxx are the last 6 hex digits of the MAC address)

SET SNMP GETCOMM

Set Community Name

SET SNMP GETCOMM <string>

(default = "public")

SET SNMP JETADmin

Enable or disable JetAdmin compatibility

```
SET SNMP JETADmin [ ENable | DIsable]
(default = enabled)
```

SET SNMP SETCOMM1

Set Community 1 Name

```
SET SNMP SETCOMM1 <string>
(default = "internal?")
```

SET SNMP SETCOMM2

Set Community 2 Name

```
SET SNMP SETCOMM2 <string>
(default = "pass")
```

SET SNMP CONtact

Set system contact string

```
SET SNMP CONtact <string>
(default = <null>)
```

SET SNMP LOCation

Set the system location string

```
SET SNMP LOCation <string>
(default = <null>)
```

SH SERIAL

Displays the serial number of the unit

sample output:

```
Serial number is 9047595
```

SH SERVEr

Shows Server parameters

sample output:

```
Serial Server Serial # 9047595
Address: 00-40-17-8A-0E-2B Name: TWC_8A0E2B Number: 0
Identification: Network Server
Enabled Characteristics:
```

Link DOWN

SH SERVEr CO

Shows Server network statistics

sample output:

```
Seconds Since Zeroed: 163 Frames Sent, 1 Collision: 26
Bytes Received: 72950 Frames Sent, 2+ Collision: 5
Bytes Sent: 18726 Send Failures: 0
Frames Received: 752 Send Failure Reasons: 0
Frames Sent: 181 Receive Failures: 503
Multicast Bytes Rcv'd: 64474 Receive Failure Reasons: 1
Multicast Bytes Sent: 2406 Unrecognized Destination: 0
Multicast Frames Rcv'd: 626 Data Overrun: 0
Multicast Frames Sent: 11 User Buffer Unavailable: 0
Frames Sent, Deferred: 2014 System Buffer Unavailable: 1
```

SH SNMP

Shows the state of the SNMP protocol enable

sample output:

```
SNMP is Enabled
```

SH VErsion

Shows the WiComm's firmware version

sample output:

```
serial server
Firmware Ver. 4.19 (2004.10.31)
Boot Ver. 1.4
16Mbit Flash
Protocols supported:
NetBIOS SNMP TCP/IP EMail DHCP
```

Zero

Clears and resets the network statistic counters

4. Service Commands

SET SERVI <service name> BOT

Set beginning of transmission (BOT) string index for service

```
SET SERVI <service name> BOT nn
(default = 1)
```

SET SERVI <service name> EOT

Set end of transmission (EOT) string index for service

```
SET SERVI <service name> EOT nn
(default = 1)
```

SH SERVI STRings [*string_num*]

Defines the BOT and EOT strings used in services. If *string_num* is provided then the specific string definition and expansion is displayed. If *string_num* is not provided, then all string definitions (but not their expansions) are displayed.

sample output:

```
10: \FF\04\FF\05\FF\06\FF\08
```

SET SERVI <service name> FIlter

Set filter index for service.

```
SET SERVI <service name> FIlter nn
```

SH SERVI FILters

Shows filter settings.

sample output:

```
# Service Name Filter
1 TWC_FFFFFF 0: No Filter
2 BINARY_P1 0: No Filter
3 TEXT_P1 1: Text Substitution m= LF, r= CRLF
4 TWC_FFFFFF_P1_4 0: No Filter
5 TWC_FFFFFF_P1_5 0: No Filter
6 TWC_FFFFFF_P1_AT 4: PostScript Tagged Binary
```

SET SERVI <service name> FMS

Set filter 1 (text replacement filter) match string index. If the index is zero, the default string of <LF> (line

feed) is used.

```
SET SERVI <service name> FRM nn
(default = 0 )
```

SET SERVI <service name> FRS

Set filter 1 (text replacement filter) replace string index. If the index is zero, the default string of <CRLF> (carriage return-line feed) is used.

```
SET SERVI <service name> FRS nn
(default = 0 )
```

SET SERVI <service name> IP

Enable or disable all IP based jobs (lpd, raw tcp, ftp, etc.) on the service.

```
SET SERVI <service name> IP [ENable | DIsable]
(default = enabled for service 1 and 2, disabled for all others)
```

SET SERVI <service name> NAme

Change the service name

```
SET SERVI <service name> NAme <newname>
(default varies by service)
```

SET SERVI <service name> POrt

Set the output port associated with a service.

```
SET SERVI <service name> POrt <portname>
(default = "S1")
```

SET SERVI <service name> PRIority

Set priority for service if multiple service try to transmit data at the same time. Higher priority services are serviced first.

```
SET SERVI <service name> PRIority nn
(default = 10)
```

SH SERVI PRI [*service_num*]

This shows the priority of a specific service. If *service_num* is not provided, the priority of all services is listed.

SET SERVI <service name> RECeive

Set receive only mode for a service. This option is rarely required, but some host applications do not

operate properly if data is received back from the serial device.

```
SET SERVI <service name> RECeive [ENable | DIsable]
(default = disabled)
```

SET SERVI <service name> TCP

Set raw TCP port for service. If port number is zero, raw TCP is disabled on that service.

```
SET SERVI <service name> TCP nn
(default = 9100 for service 1, 3001 for service 2)
```

SH SERVI SUMmary [*service_num*]

Shows the basic parameters for a specific service. If *service*_num is not provided, parameters for all services are displayed.

NOTE: The command SH SERVI is equivalent to SHOW SERVI SUM.

5. String Commands

These commands configure strings used with services and service filters.

SET STRing

Set service string table entry. (Note, String 1-11 cannot be set or changed).

```
SET STRing <string #> ”value”
```

CL STRing

Clears the service string table entry.

```
CL STRing <string #>
```

SH STRing [*string_num*]

Defines the BOT and EOT strings used in services. If *string_num* is provided then the specific string definition and expansion is displayed. If *string_num* is not provided, then all string definitions (but not their expansions) are displayed.

sample output:

```
1:
2: \1BE
3: \04
4: \1B%-12345X
```

```
5: @PJL
6: ENTER LANGUAGE=
7: PCL\0A
8: POSTSCRIPT\0A
9: \FF\04\FF\05\FF\06\FF\07
10: \FF\04\FF\05\FF\06\FF\08
11: \0C
```

SH FILters

Shows the available filters that can be used to modify a job stream.

sample output:

```
# Filter
0 No Filter
1 Text Substitution
2 AppleTalk
3 Text to PostScript
4 PostScript Tagged Binary
5 DC1 Special
```

6. TCP/IP Commands

SET IP ACcess

Allow or disallow access to a block of remote addresses

```
SET IP ACcess [EN | DI | ALL] aa.bb.cc.dd {MAsk ee.ff.gg.hh]
(default = empty list)
```

SET IP RANge

Allow or disallow access to a range of remote addresses

```
SET IP RANge [EN | DI | ALL] aa.bb.cc.dd {MAx ee.ff.gg.hh]
(default = empty list)
```

SH IP ACcess

Display current access list settings

Sample output:

```
All hosts permitted access
```

SET IP ADdress

Set server IP address

```
SET IP ADdress aa.bb.cc.dd
(default = 192.0.0.192)
```

SET IP ARP ENable

Enable or disable setting of IP address with an ARP packet

```
SET ARP [ENable | DIsable]
(default = enable)
```

SET IP BAnner

Enable or disable printing of job banner on LPD jobs

```
SET IP BAnner [ENable | DIsable]
(default = disable)
```

SET IP CHKSUM

Enable or disable verification of the IP checksum on received packets

```
SET IP CHKSUM [ENable | DIsable]
(default = enable)
```

SET IP BOot

Number of tries for each enabled IP boot method, if not set to STATIC

```
SET IP BOot n
(default = 3)
```

SET IP ENable

Enable or disable all IP based protocols

```
SET IP [ENable | DIsable]
(default = enable)
```

SET IP FTIme

If enabled, the IP timeout is measured in seconds. If disabled, the IP timeout is in minutes.

```
SET IP FTIme [ENable | DIsable]
(default = disable)
```

SET IP FTP

Enable or disable the FTP protocol

```
SET IP FTP [ENable | DIsable]
(default = enable)
```

SET IP HTTP

Enable or disable the HTTP protocol

```
SET IP HTTP [ENable | DIsable]
(default = enable)
```

SET IP KEepalive

Set interval at which TCP keepalive packets are sent on a connection, in minutes.

```
SET IP KEepalive n
(default = 5 min)
```

SET IP LPD

Enable or disable the LPD protocol

```
SET IP LPD [ENable | DIsable]
(default = enable)
```

SET IP MEthod

Set method of getting IP address

```
SET IP MEthod [ AUTO | BOOTP | RARP | DHCP | STATIC ]
(default = AUTO)
```

SET IP PIng

Send IP ping packets to test connection to remote host.

```
SET IP PIng aa.bb.cc.dd
```

SET IP PRObe

Enable or disable TCP connection probes

```
SET IP PRObe [ENable | DIsable]
(default = disable)
```

SET IP RARp

Enable setting of default router and/or subnet mask based on the source of a RARP IP address set.

```
SET IP RARp nn
```

```
nn: 0=both 1=no subnet, 2=no router, 3=neither (default = 0)
```

SET IP REtry

Enable or disable LPD retry on incomplete job

```
SET IP REtry [ENable | DIsable]
(default = disable)
```

SET IP ROuter

Set the default router address

```
SET IP ROuter aa.bb.cc.dd
(default = 0.0.0.0)
```

SET IP SUbnet

Set the IP subnet mask

```
SET IP SUbnet aa.bb.cc.dd
(default = 0.0.0.0)
```

SET IP TCP

Enable or disable the raw TCP (9100) protocol

```
SET IP TCP [ENable | DIsable]
(default = enable)
```

SET IP TELnet

Enable or disable the TELNET protocol

```
SET IP TELnet [ENable | DIsable]
(default = enable)
```

SET IP TFTP

Enable or disable the TFTP protocol

```
SET IP TFTP [ENable | DIsable ]
(default = enable)
```

SET IP TImeout

Set TCP Inactivity timeout , in seconds if fast timeout is enabled, otherwise in minutes.

```
SET IP TImeout n
(default = 1 minute)
```

SET IP WIndow

Set TCP maximum window size in bytes

```
SET IP WIndow nn
(default = 10240)
```

SH IP

Shows TCP/IP related Parameters

sample output:

```
IP is enabled
IP address 192.0.0.192 Boot tries 3
Subnet mask 0.0.0.0 Boot method AUTO
IP Gateway 0.0.0.0 Max window 10240
(set manually)
LPD banner disabled Timeout 1 min
LPD retries are disabled Keepalive 5 min
Service Port TCP port
xxxxxx_S1_A S1 9100
xxxxxx_S1_B S1 3001
```

7. Power Configuration Commands

SET POWER DELAY nnnn

This is the time, in milliseconds, to wait before the processor goes into power save mode. If no I/O occurs on the network or from the attached peripheral within this time period, the processor will go into low power mode. The value must be between 0 and 1800000 (30 minutes). A value of 0 disables processor power saving. The default value is 0.

SET POWER PERIOD nnnn

If radio power save is enabled, this is the time, in milliseconds, between radio wake up events. The value must be between 1 and 65535. The default value is 65535.

SET POWER WINDOW nnnn

This is the time, in milliseconds, the radio stays awake each time it wakes up in power save mode (i.e., every PERIOD msec the radio wakes up for WINDOW msec to see if there is traffic for it). The value is in

the range of 0-100. Zero disables the radio power save mode (the CPU may still go into power save based on the DELAY parameter). The default is 0 (disabled).

8. Firmware Update

These commands set up the unit for performing an update of the server firmware.

SET LOAd ENable

If enabled, the firmware performs a soft reset and enters the server boot program after the next EXIT command. This command should not be used with WiComm end-users. It remains in the firmware for diagnostic use.

```
SET LOAd (ENable | DIsable ]
(default = disable)
```

SET LOAd HOst

Set the node name of the Netware boot host. Note that Netware download is not supported on the Serial Server, so this command should not be used.

```
SET LOAd HOst <name>
(default = <null>)
```

SET LOAd IP

Set the IP address of the source computer for a TFTP get operation.

```
SET LOAd IP aa.bb.cc.dd
(default = 0.0.0.0)
```

SET LOAd SOftware

Set filename on host for TFTP get update.

```
SET LOAd SOftware <filename>
```

SET LOAd TFTP

Initiate firmware update via a TFTP get operation. The TFTP server address must be set via SET LOAd IP and the filename via SET LOAd SOfware. The server will reset after the firmware update is completed.

```
SET LOAd TFTP
```

SET LOAd XModem

Initiate firmare update via the serial console using the XModem protocol. The server will reset after the firmware update is completed.

```
SET LOAd XModem
```

SH LOAd

Shows the firmware update parameters

sample output:

```
Firmware load is disabled
Load Host IP = 0.0.0.0
Software file = xxxx.bin
Load Host Name =
```

9. Other Commands

SET DEFAULT

Set parameters to factory defaults

EXIT

This command exits the current configuration console session.

```
EXIT
```

SH FATal

Shows fatal error log (if there's any)

sample output:

```
No saved errors
```

CL FATal

Clears the fatal error log

SH FREE

Shows the amount of heap and configuration memory available

sample output:

```
2 bytes of heap available
Index 2, 6320 bytes
```

```
6320 bytes configuration memory available
```

HElp <command>

This is for getting help on the console commands. You can just type help, or type help and then a command to display instructions on specific commands.

Sample output:

```
EXIT/^D Exit program
HElp Information on available commands
INitialize Reset unit
CLear/PUrge/DELete Remove configuration item
SAVE Save configuration to NV memory
SET/DEFine/CHange Modify unit parameters
SHow Display unit parameters
ZEro Zero statistical counts
Type 'HElp <cmd>' for more information
```

INIT

This command instructs the server to do a soft reset when the next exit command is executed.

```
INIT
```

SET PAssword

Set the server access (read) password

```
SET PAssword <password>
(default = "ACCESS")
```

SET POWERON

Set Power on delay

```
SET POWERON <delay-sec>
default == 0 (no delay)
```

SH POWERON

Displays Power on delay in seconds

SET PROTect

Set update password to the string given.

```
SET PROTECT <password>
(default = <null>)
```

CL PROTect

Set update password to <null>.

```
CL PROTECT
```

SAVE

This command saves the current configuration to non-volatile memory. Without this command, the configuration is not saved unless an “EXIT” command is performed.

```
SAVE
```

SH TEst

Sends the configuration data via ASCII to the serial port

UNPROTECT

If an update password has been defined (SET PROTect), this command is used to enter the password to allow configuration items to be modified. After entering this command, the server will prompt for the update password. If entered properly, the user will then be able to execute SET commands to modify the server configuration. This lasts only until the console session is terminated with an EXIT command.

```
UNPROTect
```

Chapter 5. Troubleshooting

1. Introduction

This section describes procedures for troubleshooting problems you may encounter with WiComm, and is divided into the following sections:

- Installation Problems
- Intermittent Problems
- Protocol-Specific Problems

2. Troubleshooting Installation Problems

If you cannot access the connected serial device via WiComm, first check the network connection and cabling.

- Check the physical cabling to ensure all cables are plugged in (Ethernet and DB-9 serial cable).
- If the appropriate LEDs are not illuminated, then there is probably a bad 10baseT or 100baseTX cable, or the hub port is bad. If possible, try a different cable and hub port, or try connecting a different device to the cable.
- Verify that you are using the correct values for both IP Address and Port Number. A common mistake is to assume the TCP port number is the "device number" on the server.
- If you are using a hub, verify that the hub port is operating correctly by trying WiComm on a different port.

3. Troubleshooting Network Configuration Problems

- If you are using TCP/IP, make sure that your computer and WiComm are on the same IP segment or can reach each other with a PING command from the host. The IP address you assign to WiComm must be on the same logical network as your host computers (e.g., if your computer has an IP address of 192.189.207.3 and the subnet mask of 255.255.255.0, WiComm should have an IP address of 192.189.207.x, where x is an integer between 1 and 254), or you must properly configure your router address to work with WiComm.
- If your Device Server is set to Auto or DHCP for obtaining an IP Address, it is possible that WiComm's IP address can change. Either configure your DHCP server to give WiComm a permanent lease, or configure WiComm to be on a STATIC IP address outside the scope of the DHCP addresses.
- The problem may be the result of mismatched or duplicate IP addresses. Verify that the IP address is correctly loaded into WiComm (via the displayed or printed configuration information or through the remote console), and make sure that no other nodes on the network have this address (duplicate addresses are the biggest cause of TCP/IP connectivity problems). If the IP address is not correct, then check whether the loading procedure was properly executed.
- Also verify that the host computer and WiComm are using the same subnet masks(for example, if WiComm has a subnet mask of 255.255.255.0, the host must have the same subnet mask) or that the router is properly configured to pass data between the two devices.
- If the wrong IP address is loaded, check your network for file servers that have DHCP, BOOTP, or rarp enabled, and make sure that these file servers are not set up to load IP addresses into WiComm.

4. Troubleshooting Windows Problems

- If you are having trouble accessing the connected serial device through Windows, ensure you can ping WiComm using the DOS command PING ipaddress, where ipaddress is the IP address of WiComm. If you cannot ping WiComm, you will not be able to access the serial device.
- If you are running COM port emulation software and the software reports an error, verify that the correct serial/IP COM port is being used when the application runs. Verify that your application's COM port settings have been changed to use the Serial/IP COM ports.

5. Troubleshooting Wireless Configuration Problems

- Verify that your PC's wireless adapter and/or access point is configured properly – note the settings, paying special attention to the wireless mode, SSID or network name, WEP or security, and IP address settings so you can configure your Device Server to the same wireless settings.
- Make sure you have a good wireless signal from your PC and from WiComm, that WiComm is within range (90 meters or 300 feet), and that it is away from metal objects and other devices that generate radio signals (like Bluetooth devices, cordless phones, and microwave ovens).
- Make sure your computer is set to infrastructure mode if you are connecting through an access point, or ad-hoc (802.11) if you are connecting to WiComm without an access point. See the documentation for your wireless adapter for details.
- If you want to use WEP encryption or password protection for your wireless network, and your wireless adapter or access point normally uses a password or passphrase instead of WEP, it should allow you to enter 0x followed by a 10-digit key (for 40-bit or 64-bit WEP) or 26-digit key (for 128-bit WEP) in hexadecimal format (0-9 or A-F).
- If you are experiencing slow performance or are having intermittent problems connecting, try changing the RF channel of your wireless network. The RF channel can be changed via the ExtendView Utility or the web browser configuration utility for WiComm. See your wireless adapter and/or access point documentation for more information. When changing the RF channel, it is recommended that you select a channel that is at least three channels lower or higher than any other wireless networks within range.

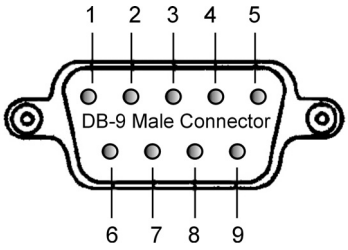
Appendix A. Product Specifications

COMPONENT	SPECIFICATION
Model	WiComm
Processor	Motorola Coldfire MC5272
Flash Memory	2 Mbytes
RAM Memory	8 Mbytes (SDRAM)
Processor Speed	66 MHz
Interfaces Supported	Serial: RS-232, RS-422, RS-485 (via 9-pin jack) (Modbus support for RS-232 / RS-485 networks) Ethernet: 10/100BaseT (via RJ-45 8-wire jack)
Baud Rates Supported (Kbps)	1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200, 230400, 460800
Network Protocols Supported	FTP, TFTP, Telnet, BootP, DHCP, RARP, ARP, UDP, ICMP, SMTP, SNMP
Power Requirements	800 mA (max) at +5 VDC (wireless)
Power Module	(wireless) Input: 120 / 220 VAC, Output: 1 A at +5 VDC
RADIO PERFORMANCE	**SPECIFICATION**
Description	2.4 GHz Direct Sequence Spread Spectrum (DSSS) 802.11b wireless CF card
Interoperability	Interoperable with Wi-Fi (WECA) certified products (AP, card, etc.)
Host Interface	16-bit CompactFlash V1.4 I/O interface, type II
Chipset	Prism 3.0 chipset
Data Rate	11, 5.5, 2, and 1 Mbps per channel

Power Consumption	TX power consumption: 262 mA (typical) RX power consumption: 260 mA (typical) Sleep Mode power consumption: 65 mA (typical)
Voltage	3.3 VDC + /– 5%
LED	Link status, Power
Network Architecture Types	Supports ad-hoc, infrastructure, roaming (standard IEEE 802.11b compliant)
Receiver Sensitivity	-84 dBm @ 1 Mbps -84 dBm @ 2 Mbps -83 dBm @ 5.5 Mbps -79 dBm @ 11 Mbps
RF Output Power	14 dBm
Antenna	Omni-directional, 1.5 dBi gain
Operating Channels	11 for North America, 13 for Europe (ETSI)
Operating Frequency	2.412 – 2.462 GHz (North America) 2.412 – 2.472 GHz (Europe ETSI)
Modulation	CCK (11 Mbps, 5.5 Mbps), DQPSK (2 Mbps), DBPSK (1 Mbps)

Appendix B. Serial Port Pinouts

PIN	RS-232 (DTE)
1	DCD (Data Carrier Detect) Input
2	RxD (Receive Data) Input
3	TxD (Transmit Data) Output
4	DTR (Data Terminal Ready) Output
5	GND (Signal Ground)
6	DSR (Data Set Ready) Input
7	RTS (Request To Send) Output
8	CTS (Clear To Send) Input
9	RI (Ring) or +5 VDC power input (selectable via 3-pin jumper)



PIN	RS-422 and RS-485 (4-wire, full duplex)
2	RD+ (Receive Data +) Differential Input
3	TD+ (Transmit Data +) Differential Output
4	TD – (Transmit Data –) Differential Output
5	GND (Signal Ground)
6	RD – (Receive Data –) Differential Input
9	Optional +5 VDC power input (selectable via a 3-pin jumper)

PIN	RS-485 (2-wire, half duplex)
3	TD+/RD+ (Transmit / Receive Data +) Differential Bi-directional
4	TD –/RD – (Transmit / Receive Data –) Differential Bi-directional
5	GND (Signal Ground)
9	Optional +5 VDC power input (selectable via a 3-pin jumper)

TCP Port Connections

WiComm supports port connections over TCP/IP using raw TCP ports only. The TCP ports are allocated as follows:

Port	Destination Device
502	Used for MODBUS communications
3001	RS-232, RS-422, or first RS-485 device in mulitdrop configuration
9100	RS-232, RS-422, or first RS-485 device in mulitdrop configuration
9200	RFC 2217

Appendix C.
Alternate Power Source Configuration

WiComm can be configured to use a +5 VDC input via Pin 9 on the DB-9 connector to power the unit instead of using the supplied power supply module. To configure WiComm to accept power via Pin 9, WiComm case must be opened, and the shunt at JP3 must be moved from Pins 2 and 3 to Pins 1 and 2 (towards the +5 indicator). The voltage measured between Pins 9 and 5 must be at least +4.8 VDC and not greater then +5.2 VDC. Minimum supply current is 800 mA and 500 mA for the wireless and non-wireless Device Server, respectively. If Pin 9 is utilized for power, it is recommended that shielded cable be used to minimize EMI (Electro-Magnetic Interference).

1. RS-232 Port

In RS-232 mode, the DB-9 male connector is configured as a Data Terminal Equipment (DTE) port. Figure 1 below shows a null-modem cable connection to another DTE device.

Pin	Description
1	DCD (Data Carrier Detect) Input
6	DSR (Data Set Ready) Input
2	RxD (Receive Data) Input
3	TxD (Transmit Data) Output
4	DTR (Data Terminal Ready) Output
7	RTS (Request To Send) Output
8	CTS (Clear To Send) Input
5	Ground
9	RI (Ring) Input or +5 VDC Power Input (Optional)

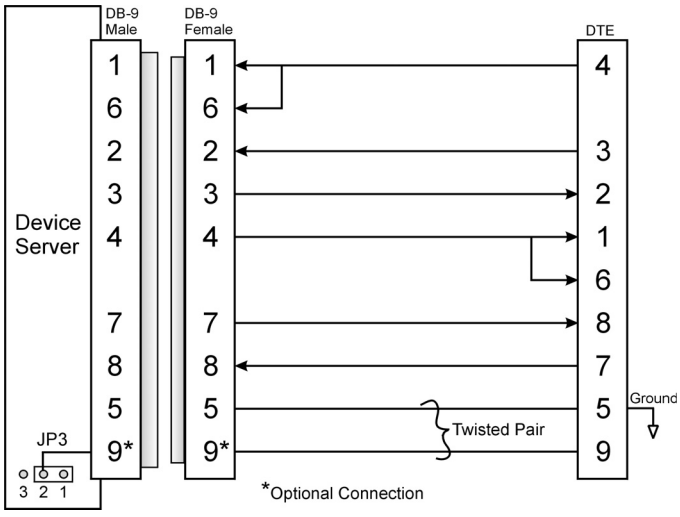


Figure 1

2. RS-422 / 485 Full Duplex Port

In RS-422 / 485 full duplex mode, the DB-9 male connector is configured as follows. It is important to construct the cable so that an unshielded twisted pair (UTP) wire is used for the transmit pair and another UTP wire is used for the receive pair to minimize EMI emissions and maximize immunity to outside sources (see Figure 2). If WiComm is the last device in a chain, then a 120-ohm terminating resistor should be placed across Pins 2 and 6. The Pin 9 connection is optional.

Pin	Description
3	TX+ (Transmit) Output
4	TX– (Transmit) Output
2	RX+ (Receive) Input
6	RX– (Receive) Input
5	Ground
9	+5 VDC Power Input (optional)

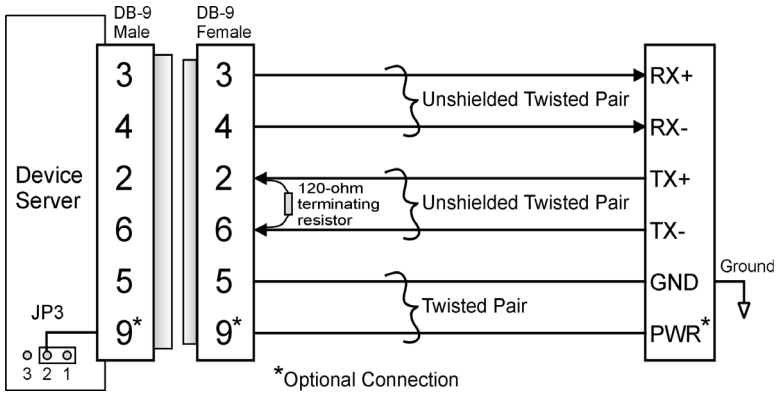


Figure 2

3. RS-485 Half-Duplex Port

In RS-485 half-duplex mode, the DB-9 male connector is configured as shown below. It is important to construct the cable so that an unshielded twisted pair (UTP) wire is used for the transmit/receive pair to minimize EMI emissions and maximize immunity to outside sources (see Figure 3). If WiComm is the last device in a chain, then a 120-ohm terminating resistor should be placed across Pins 3 and 4. The Pin 9 connection is optional.

Pin	Description
3	TX+/RX+ (Bi-Directional)
4	TX–/RX– (Bi-Directional)
5	Ground
9	+5 VDC Power Input (optional)

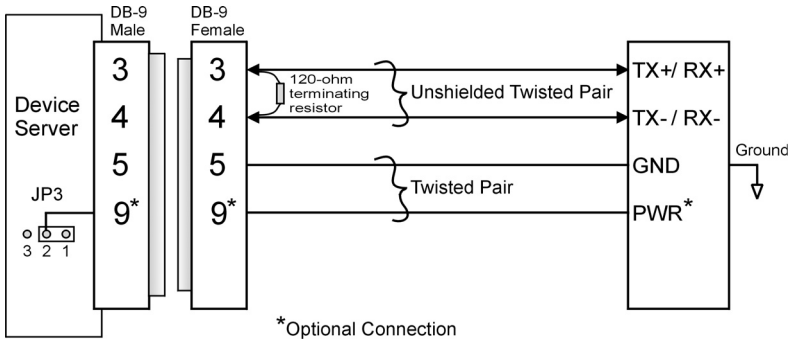
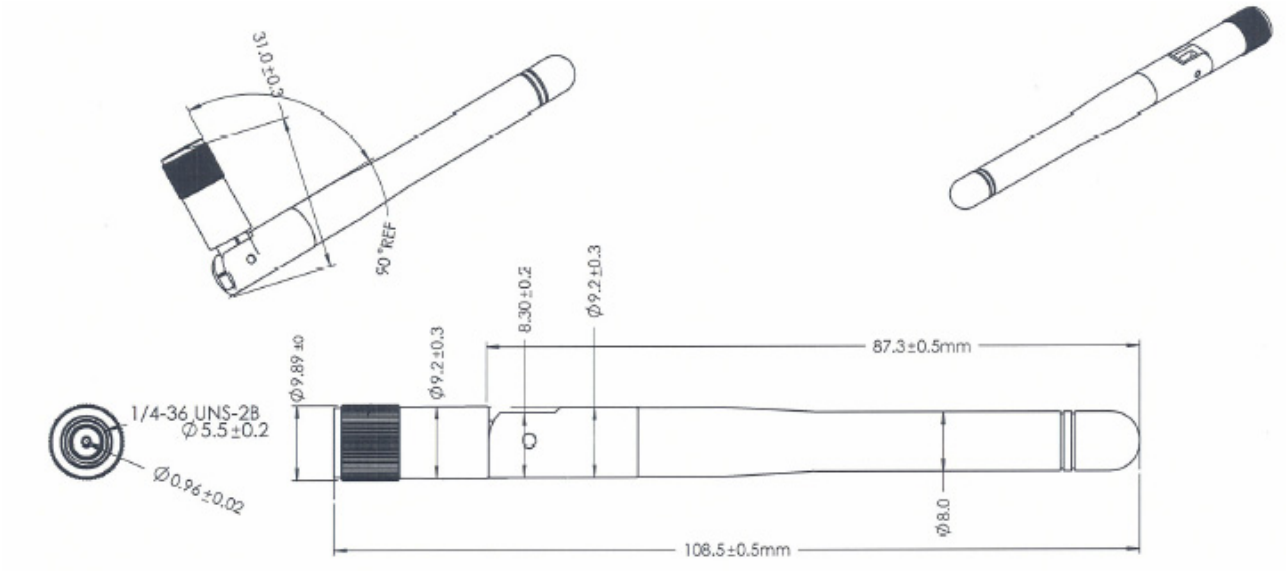


Figure 3

Appendix D. Antenna Specifications

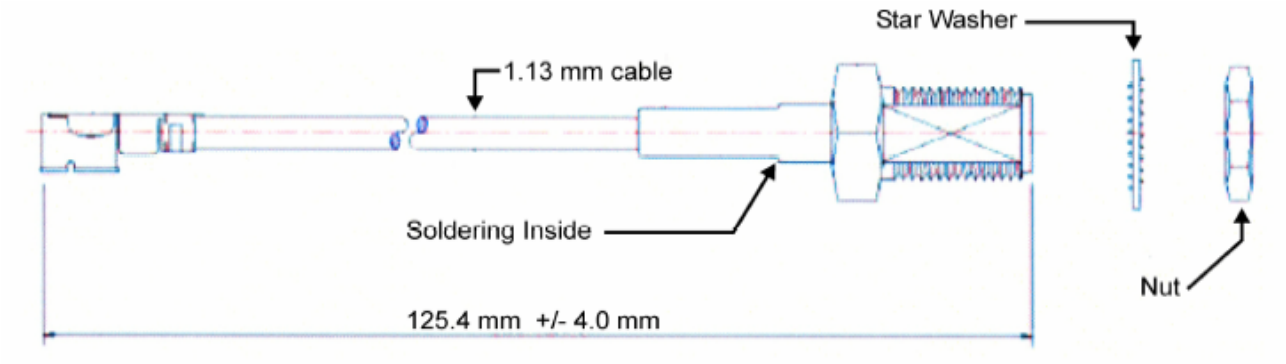
1. Antenna Assembly



Electrical Performance

Impedance	50 ohms
Frequency Range	2.4 ~ 2.5 GHz
VSWR	2.0 maximum
Gain	1.5 dbi

2. Antenna Cable Assembly



Electrical Performance

Impedance	50 ohms
Frequency Range	0 ~ 3 GHz
Working Voltage	60 VAC maximum
Dielectric Withstanding Voltage	200 VAC maximum
Insulator Resistance	500 mega-ohms minimum